DOI: 10.1590/S0080-623420140000100011

ORIGINAL ARTICLE

Prevalence of hepatitis B and C seropositivity in pregnant women

PREVALÊNCIA DE SOROPOSITIVIDADE PARA HEPATITE B E C EM GESTANTES

PREVALENCIA DE SEROPOSITIVIDAD PARA HEPATITIS B Y C EN MUJERES EMBARAZADAS

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ABSTRACT

The aim of the study was to identify the prevalence of hepatitis B and C seropositivity in pregnant women attended in a public maternity hospital located in Catalao-GO from 2005 to 2009. Descriptive, exploratory study conducted through patients` hospital records. For data analysis, we used SPSS version 18.0. The confidence interval (CI) was calculated using the Person χ^2 test, considering a significance level of 5% ($p < 0.05$). The prevalence of HBV was 5.64% and HCV 0.098%, predominantly in young pregnant women aged between 20 and 30 years old, single and in their first pregnancy.

RESUMO

O objetivo do estudo foi identificar a prevalência de soropositividade para as hepatite B e C em gestantes atendidas em uma maternidade pública do município de Catalão-GO no período de 2005 a 2009. Estudo descritivo, exploratório, realizado por meio de consulta aos prontuários. Para a análise dos dados utilizou-se SPSS versão 18.0. O intervalo de confiança (IC) foi calculado por meio do teste de Person χ^2, considerando um nível de significância de 5% ($p < 0,05$). A taxa de prevalência de VHB foi de 5,64% e a de VHC, de 0,098%, predominantemente em gestantes jovens, com idade entre 20 e 30 anos, solteiras e primigestas.

RESUMEN

El objetivo de este estudio fue identificar la prevalencia de seropositividad para los virus de la hepatitis B y C en mujeres embarazadas atendidas en una maternidad pública de Catalão-GO entre los años 2005 y 2009. Se trata de un estudio descriptivo-exploratorio realizado a partir de la revisión de las fichas clínicas de las pacientes. Para el análisis de los datos se utilizó el programa SPSS versión 18.0. El intervalo de confianza (IC) fue calculado por medio del test de Person χ^2, considerando un nivel de significancia de 5% ($p < 0,05$). Las tasas de prevalencia de los virus de la hepatitis B y C fueron de 5,64% y 0,098% respectivamente. La mayor frecuencia de seropositividad de estos virus se observó en embarazadas entre 20 y 30 años, solteras y primigestas.

DESCRIPTORS

Hepatitis B virus
Hepacivirus
Infectious disease transmission vertical
Prenatal care
Obstetrical nursing

DESCRITORES

Vírus da hepatite B
Hepacivirus
Transmissão vertical de doença infecciosa
Cuidado pré-natal
Enfermagem obstétrica

DESCRIPTORES

Virus de la hepatitis B
Hepacivirus
Transmisión vertical de enfermedad infecciosa
Atención prenatal
Enfermería obstétricaA

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Português / Inglês
www.scielo.br/reeusp

Received: 03/18/2013
Approved: 10/03/2013

INTRODUCTION

Viral hepatitis are considered a serious public health problem in Brazil. According to the Ministry of Health, there are approximately two million chronic carriers of hepatitis B virus and three million hepatitis C carriers[1]. The fact that they are silent infections favors the delayed diagnosis, resulting in the appearance of acute or chronic diseases that affect the liver.

The identification of the etiologic agent by means of serologic test allows the adoption of appropriate measures for prevention and control. Therefore, it is necessary that people regularly do tests with primary care health teams, which have an important role in the prevention, diagnosis, screening and monitoring of people with the disease.

The hepatitis B virus (HBV) is the leading cause of chronic liver disease worldwide. Epidemiological data estimate that approximately 400 million people are infected by this etiologic agent and that 15-40% of these individuals will develop cirrhosis, heart failure or hepatocellular carcinoma[2]. Vertical transmission accounts for 35-40% of new cases of hepatitis B in the world, and it is through this type of transmission that the virus is maintained in the population. Chronic infection occurs in 90% of infected children in the neonatal period, particularly those whose mothers present HBsAg and HBeAg positive at birth[2].

The World Health Organization estimates the number at 170 million chronic carriers of hepatitis C. The hepatitis C virus (HCV) was identified in 1989[1], it is the main etiological agent of chronic hepatitis, formerly known as non-A, non-B. Its intrauterine transmission is uncommon and infection occurs primarily parenterally, affecting users of intravenous or inhaled drugs, people with tattoos and piercings or showing other forms of dermal exposure and also individuals who received blood transfusions before 1993. It is assumed that HCV is largely responsible for cirrhosis and liver transplantation in the Western world[1].

In April 2006, Ordinance No. 2669, the Ministry of Health published the Pact for Health, whose priorities are health promotion, strengthening of primary care, elderly health, reducing child and maternal mortality and capacity for building responses to emerging diseases such as hepatitis B and C confirmed by serology[3]. In the latter case, it was proposed that goals that portray the reality of each Brazilian state should be formulated.

In relation to the goals proposed by the Pact for Life, which integrates the Pact for Health, for the state of Goias, it appears that those targets were not reached, whereas only 77% of reported cases of hepatitis B had confirmed serology in 2011, from the 5,980 cases reported in SINAN, 70% had inconclusive results or no etiologic classification, which shows that the indicator does not represent the epidemiological reality of the state. Still in the state of Goias, the detection rate for hepatitis B (per 100,000 inhabitants) in 2005 was 0.32, in 2009 was 0.28 and in 2011 was 0.34. The state has 246 municipalities and approximately 6,154,996 inhabitants[4-5].

The hepatitis B vaccine is highly immunogenic and induces the formation of antibodies (anti-HBs) against the surface antigen of hepatitis B (HBsAg). As years go by and people age, the vaccine response decreases, for instance, from 90% in adolescents and young adults, the vaccine response falls to 70% in people aged 50-59 years. In addition, there are other factors influencing the immunogenicity of the vaccine such as smoking, obesity, diabetes mellitus and HIV infection[6]. Studies have found that immunization of the mother against hepatitis B during pregnancy is safe and that the primary infant immunization with a recombinant vaccine confers long-term protection against clinical disease and chronic infection[7].

In Brazil, among the existing challenges to prevent transmission of the hepatitis B virus, in the period from 2011 to 2012 the target was 100% vaccination coverage for pregnant women, about ten years ago, this coverage was 90.9%[4,8]. The Centers for Disease Control and Prevention, the American College of Obstetricians and Gynecologists and the Brazilian Ministry of Health recommend immunoprophylaxis with vaccine administration in the first 12 hours of life, associated with specific hyperimmune hepatitis B immunoglobulin (HBIG) for newborns of pregnant women with HBV[9]. This approach prevents infection in over 90% of cases. In the U.S., 81% of obstetricians recommend the hepatitis B vaccine[9].

The gestational period is not free from infections that put the maternal-fetal health at risk. Pregnant women, when affected by infections caused by etiologic agents, as hepatitis B and C, may transmit them vertically, and such transmission may occur during pregnancy, at birth or during breastfeeding[10].

Vertical transmission has great importance in the epidemiology of viral hepatitis. In the general population, the chances of an infection by HBV viruses to evolve to the chronic form in adults is 5-10%, while for the offspring of infected mothers, this risk is approximately 90%[11].

The neonatal HBV infection most oftenly is asymptomatic and the disease progresses insidiously. The late diagnosis increases the risk of complications and increases morbidity and mortality. In children infected by vertical transmission of HBV, the risk of developing hepatocellular carcinoma is about 200 times higher than general population[9].

The HCV vertical transmission is rare in comparison to hepatitis B. Pregnant women with high viral load of HCV or co-infected with HIV have a higher risk of vertical transmission. Epidemiological data show that in 70-85% of cases become chronic occurs with a quarter to a third of them, on average, evolving to a pattern of moderate to severe histological impairment requiring treatment. The remainder evolves more slowly[1].

In the state of Mato Grosso do Sul, the Association of Parents and Friends of Exceptional Children (APAE) at Campo Grande deployed the Maternity Protection Program, popularly known as Mammy-Tests or Prenatal Screening, which favors adhesion of pregnant women to prenatal care immediately after the confirmation of pregnancy. Due to the success achieved in September 2003, the program was also implemented in the State of Goias[12].

The Ministry of Health, through the Ordinance GM/MS No. 569/GM of 2002(8), established the Program for Humanization of Prenatal and Birth (PHPN) due to the need for improved prenatal care. The program aims to reduce the rates of maternal and perinatal morbidity and mortality, expanding access of pregnant women to prenatal, obstetric and neonatal assistance[8].

Health professionals play a role as caregivers and therefore, must reflect on the humanization of prenatal care and establish a trusting relationship with clients in order to prevent and control injuries to women during pregnancy and the postpartum period, ensuring their right to safe motherhood[8]. A wide prenatal screening, including serological tests, enables the prevention and early treatment of diseases vertically transmitted to the fetus. The lack of knowledge and availability of preventive measures against infection by the hepatitis B and C are a serious public health problem, mainly because they are silent diseases.

Given the above, the objectives of this study were to identify the prevalence of HBV and HCV seropositivity in pregnant women attending a public maternity hospital located in Catalao-GO in the period 2005-2009, from the results of serology obtained from the records, and characterize the HBV and HCV positive pregnant women.

METHOD

Descriptive, exploratory study with pregnant women in the period from 2005 to 2009 in a public hospital in the city of Catalao in the state of Goias, which attend women of urban and rural areas of the municipality, neighboring cities and the adjacent districts.

Data collection was conducted from June 2010 to November 2011 from patients' medical records, through a collection instrument previously validated, containing identification data (age, place of birth, profession, marital status) and pregnancy information (gestational age, number of pregnancies, type of delivery, and whether or not prenatal care was done, number of consultations, laboratory tests carried out in prenatal care).

During prenatal care, health centers in Goias, perform tests of maternal diseases and serological tests that diagnose nine types of vertical transmission diseases, including hepatitis B and C. Collection is conducted in phases, with a minimum interval of 60 days. At first, preferably up to 12 weeks of gestational age, the goal is to detect toxoplasmosis (IGG and IGM), rubella (IGG and IGM), cytomegalovirus (IGG and IGM), syphilis, HIV 1 and 2, Chagas' disease, hepatitis B and C and HTLV 1 and 2. The second, between 28 and 30 weeks of gestation, focus on the detection of syphilis and HIV.

Before the collection, filling the form for registration of pregnant women in SISPRENATAL is required. After that, the collection on filter paper obtained from peripheral blood by puncture with a sterile lancet, usually in the pregnant woman's ring finger, or through venipuncture is performed. The material is packaged to dry for 1 hour, then it is placed in an envelope and mailed to the laboratory APAE Goiania, where the tests are performed, the results returned for the disposal unit in 15 to 20 days. If the result is positive or doubtful for one or more injuries in this initial screening, the woman is subjected to another test to confirm the diagnosis. In case it is positive, the mother is referred to be monitored by a multidisciplinary team of APAE Goiania, in case the municipality does not rely on specialized professional to meet the pregnant woman needs.

The study was approved by the Ethics Committee in Research of the Federal University of Goias, protocol No. 043/2009. The study was based on the guidelines and standards for research involving human beings, which are CNS Resolution 466/2012. The legal representatives of the maternal public hospital, the City Health Department and the Institute of Diagnostics and Prevention APAE Goiania were informed about the objectives of the research and the Consent Form (CF) was signed after being informed about the possible risks and benefits of the study.

The data were tabulated in an electronic spreadsheet and we used the version 18.0 of the Statistical Package for the Social Sciences (SPSS) for the analysis. The confidence interval (CI) was calculated using the Person χ^2 Test, considering a significance level of 5% ($p<0.05$).

RESULTS

The patients` medical records of 2,037 women were consulted, whose age ranged 13-40 years old. Table 1 summarizes the characteristics of mothers of 105 positive cases for anti-HBc (p=0.41) found among 1,303 pregnant women who were examined, of which 720 were aged between 21-30 years, age group in which there was higher frequency of seropositive cases (n=56, 7.8%). Further 10 positive cases were found for HBsAg (p=0.36) among the 1,643 women who were examined. In this test, it was also observed with more frequency (n=6, 0.7%) from 21 to 30 years, among 909 pregnant women in this age range.

From 1,641 women who underwent anti-HCV test, two positive cases were identified: in one case, the mother was less than 20 years old and, on the other, she was between 21 and 30 years old. During the study period from 2005 to 2009, prevalence rate (PR) was 5.64% for HBV and 0.098% for HCV.

Table 1 - Characterization of pregnant women enrolled from August 2005 to December 2009, with positive anti-HBc, HBsAg and anti-HCV - Catalao, GO, Brazil 2012

	Anti- HBc				HBsAg				Anti-HCV			
	N	n positive	(%)	P	N	n positive	(%)	P	N	n positive	(%)	p
Age				0.41				0.36				0.89
<20	382	27	7.1		475	1	0.2		475	1	0.2	
21-30	720	56	7.8		909	6	0.7		910	1	0.1	
31-39	184	20	10.9		235	3	1.3		232	0	0.0	
>40	17	2	11.8		24	0	0		24	0	0.0	
Total	1.303	105	37.6		1.643	10	2.2		1641	2	0.3	
Marital status				0.09				0.86				0.67
Married	469	31	6.6		659	6	0.9		658	0	0.0	
Single	522	41	7.8		623	2	0.3		622	2	0.3	
Divorced	9	2	22.2		11	0	0.0		11	0	0.0	
Separated	4	1	25.0		4	0	0.0		4	0	0.0	
Stable Union	279	30	10.7		319	2	0.6		319	0	0.0	
Total	1.283	105	72.3		1616	10	1.8		1614	2	0.3	
Type of Labor				0.34				0.33				0.73
Surgical	615	53	8.6		777	6	0.7		776	1	0.1	
Not surgical	651	51	7.8		829	4	0.4		828	1	0.1	
Total	1.266	104	16.4		1606	10	1.1		1604	2	0.2	

Among 105 seropositive women for anti-HBc, 41 positive cases (p=0.09) were single. From 09 divorced women, 02 (22.0%) were seropositive, and the 04 separated women, 01 (25.0%) was seropositive. As for HBsAg, the largest number of cases occurred in married women: 6 in 10 (p=0.86). Two positive cases were reported to anti-HCV (p=0.67) among single women.

Regarding occupation, among the 899 women who were devoted to household services, there were 72 positive cases for anti-HBc (p=0.78). We observed 8 HBsAg positive cases among the 1,117 women tested (p = 0.00). There was no case registered among the 1,113 women tested for anti-HCV (p = 1.00). Among women who had activities outside the home, 25 positive cases for anti-HBc among 325 women; two positive cases for HBsAg among 430 tests and a case for anti-HCV of 430 pregnant women studied.

Regarding the number of abortions, the incidence was higher in women under 20 years, registering 10 positive cases out of a total of 179 anti-HBc (p=0.57) and 1 positive case for HBsAg (p=0,99).

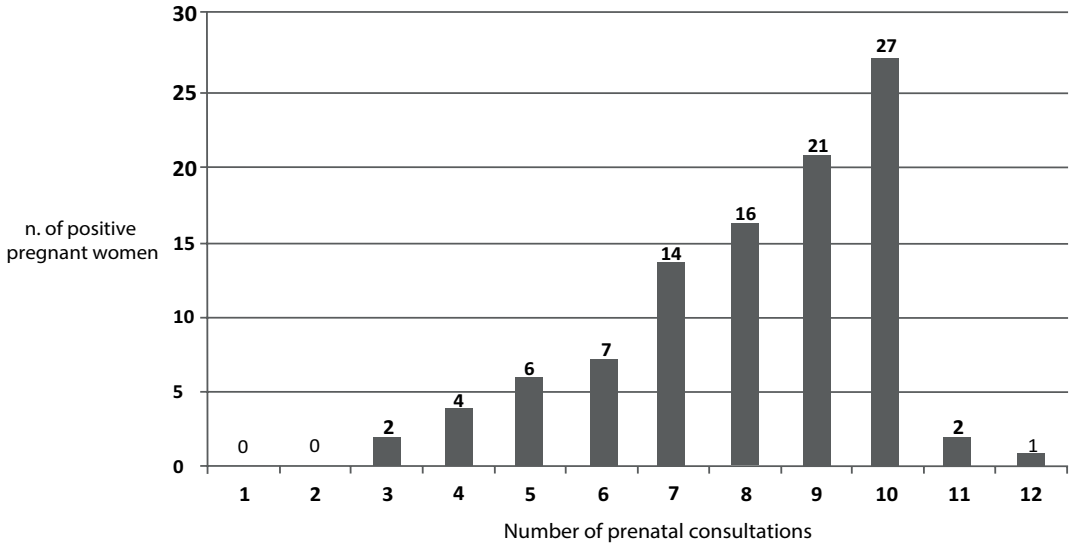

Figure 1 – Number of prenatal consultations performed by seropositive pregnant women for anti-HBc, from August 2005 to December 2009 - Catalao, GO, Brazil, 2012.

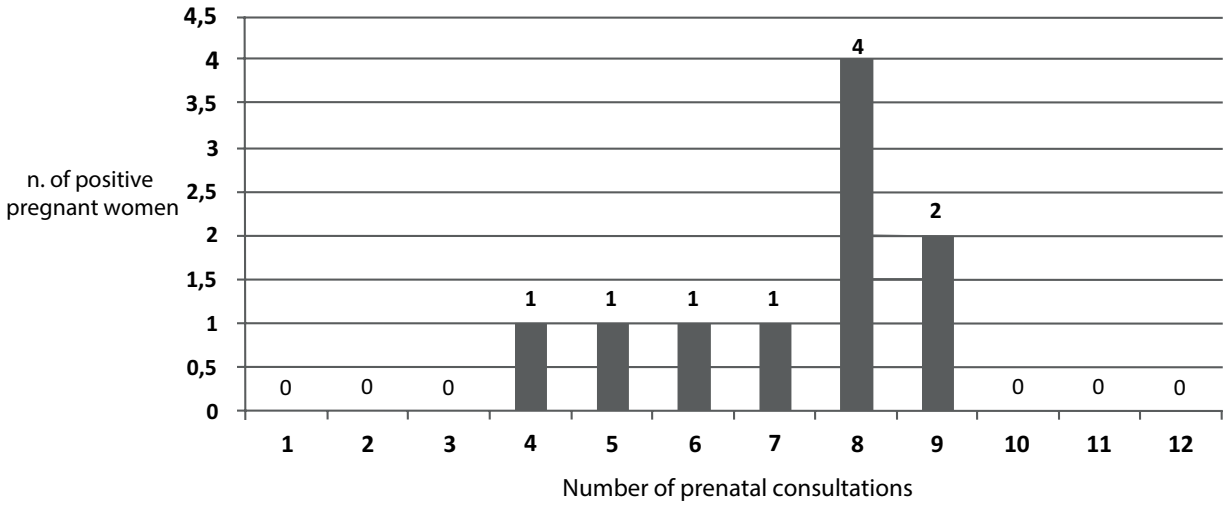

Figure 2 – Number of prenatal consultations by seropositive pregnant women for HBsAg, from August 2005 to December 2009 - Catalao, GO, Brazil, 2012

There was no significant difference in the association between age, profession, marital status and being positive for anti-HBc, HBsAg and anti-HCV (p>0.05). From the 105 seropositive women for anti-HBc, 100 underwent prenatal care, as well as all 10 seropositive for HBsAg, revealing great adhesion of these women to the basic care service (Figures 1 and 2).

The two seropositive pregnant women for anti-HCV underwent prenatal care (p=0.98). When we considered the number of pregnancies, the largest number of positive cases for anti-HBc involved primiparous, totaling 36 out of the 105 seropositives women (p=0.72). The same occurred with the HBsAg-positive mothers, with 4 cases of first pregnancy among 10 seropositive (p=0.99). In seropositive pregnant women for anti-HCV (p=0.99) a rate of 50% in their first pregnancy was observed.

Regarding the type of delivery from 105 women positive for anti-HBc (p=0.34) 53 underwent surgical delivery and 51 non-surgical delivery. From the 10 women positive for HBsAg (p=0.33) 6 carried surgical delivery, and 4 non-surgical delivery, the two women positive for anti-HCV, one performed surgical delivery, and the other non-surgical delivery (p=0.73).

DISCUSSION

The results showed higher rates of seropositivity in young pregnant women, aged between 21 and 30 years: 4.75% of positive cases for HBV and 0.3% for HCV. A similar situation was observed in a study conducted in Ribeirao Preto in which 5,191 patients were evaluated, with a mean age of 24.6 years with a range of variation 12-51 years, of whom 30% were young women with up to 20 years and 78,5%, up to 29 years. We detected 26 carriers of HBsAg antigen, with a prevalence rate of 0.5%. Vertical transmission was not the main factor of transmission of hepatitis B in the community, although not ruled out its participation as an important factor perpetuating viral diseases[11].

In the present investigation, among seropositive women for Anti-HBc, the percentage of single and married women was relatively close (6.6% and 7.8%, respectively). We observed a higher frequency of positive HBsAg among married (0.09%). These data should be carefully considered, since the study did not test whether women who identified themselves as single lived in a stable union, because this information was not available in the patients' medical records, in which lack of standardization of recorded information and on relevant aspects of the sexual history of the woman was observed.

The scientific literature has shown that being married or being in a stable union is not a protective factor against STDs, since the woman can be monogamous but not her partner. The stable relationship in general is associated with feelings of security and women and their partners may not take measures to protect themselves against STDs(13). Another aspect that must be considered is the cultural influence, showing a distinct sexual behavior before and after the diagnosis of an STD, such as the adoption of protective measures and more critical thinking regarding their own health status and submission to the wishes of partner during sexual intercourse[14].

Another factor that has not been shown is related to the communication of STDs diagnosis to sexual partners[13]. This behavior may be explained by the low understanding of the mechanism of transmission of diseases, fear of losing the partner or the financial dependence that is established in some relationships. This situation represents a major challenge to break the chain of transmission. Thus, it is essential to take into account cultural considerations, beliefs, gender relations and power in the approach and monitoring of pregnant women, especially those with STD.

Still on data related to characterization of marital status and seropositivity, attention should be paid to the high seropositivity for anti-HBc among divorced (22.2 %) or separated (25.0%) women. These data are significant because they may signal the need for the development of specific strategies to the guidance of these pregnant women in health services related to prevention, protection and transmission of STDs.

As the study did not assess the sexual habits of pregnant women, we cannot make any inferences about the causal relationship between the data and the adoption or otherwise measures of sexual protection, number of partners, contamination before or after divorce or separation and route of contamination by hepatitis viruses B and C. A study conducted in the state of Ceara, with pregnant women in the cities of Fortaleza and Aracati, it was found that, among the risk factors associated with STDs, being single, widowed or divorced made women from these cities more prone to contract an STD ($p<0.001$)[15].

In the present investigation, a prevalence rate of 5.64% to 0.098% for HBV and HCV was identified. In a study conducted in Sudan with 728 pregnant women, about 5% were HBsAg and less than 1%, HCV-positive, none of the risk factors[16].

There was a predominance of positive cases among women who were pregnant for the first time. The same occurred in a research developed in Mato Grosso do Sul with 32,512 pregnant women(10). The frequency of HBsAg was 0.3% among pregnant women aged 11 to 49 years, mean age at diagnosis was 24.2±4.8 years, the majority of seropositive pregnant women were pregnant for the first time, and the 1st trimester of pregnancy was the predominant period for the diagnosis of hepatitis B (38.6 %). For anti-HCV, the observed frequency was 0.1% and the age of seropositive pregnant women ranged from 17 to 34 years, with a mean of 25 ± 4.1 years.

There was no significant difference between the age of the pregnant women and the presence of infection with hepatitis B and C[10]. Similar results were obtained in a study in which the prevalence of anti-HCV was 0.15% and half of seropositive women were primiparous and 11% reported four or more pregnancies[17].

In the present investigation, the largest number of positive cases for anti-HBc and HBsAg was found in young, primiparous women. This fact can be explained by insufficient vaccination of adolescents and adults at high risk for infection and lack of information, care, prevention and implementing strategies to better accommodate these pregnant women. Although knowledge about hepatitis B has been demonstrating progress, there are still many questions, always requiring new studies and new approaches to educational measures.

Research conducted in prenatal service of Sao Paulo, in which 47 pregnant women attended by obstetric nurses were analyzed, all proved susceptible to hepatitis B virus. Among them, 19 (40.5%) were primiparous[18].

In this study from the 1,303 pregnant women that underwent test for anti-HBc, 17% were over 40 years old. From the 1,643 pregnant women who underwent screening for HBsAg, 24% were over 40 years old, and for anti-HCV, 24% pregnant women were also over 40 years old. This age group showed a lower frequency of pregnant women in the analyzed period.

Study performed in a metropolitan hospital of Sarandi-PR revealed that pregnancy in women over 35 years is increasingly common in obstetric practice reality, because the higher educational levels may represent a stimulus for postponing pregnancy and unprotected sex does not happen so early. In contrast, in women over 35 years, there was a greater frequency of adverse perinatal outcomes such as low birth-weight infants, preterm or post-term birth. Thus, health professionals, responsible for the care of these women, need to be aware of the characteristics of pregnancy at that stage of life[19].

In 1986, the percentage of pregnant women who had never visited a doctor was 26%, in 2006, according to the National Demographic and Health Survey (PNDS), this percentage decreased to 1.3% and at least 61% of the pregnant women had undergone seven or more visits to the doctor, including the exams. It is noted, therefore, that apart from the increase in the number of women attended, there was an increase in the supply of services provided by health units in relation to women's health[20].

In the present study, most of the women had at least 6 prenatal consultations, which shows high adhesion to service. Regarding the prevalence rate for HBV (5.64%), this proved to be inferior to a study that found an average prevalence rate of 15.5% for hepatitis B among women in Taiwan and 8.9% among southeast Asian[21].

Among pregnant women in Catalao-GO, the frequency of soropositivity for anti-HCV was 0.3%, result consistent with a study conducted in the city of Lorestan in western Iran, which identified the frequency of 0.2% of seropositivity for anti-HCV outcome in pregnant women[22].

In positive HBV cases analyzed in this study, there was little difference between the number of cesarean sections (n=59) and non-surgical deliveries (n=55). Among the positive cases for HCV, there was no difference between the number of cesarean section (n=1) and non-surgical (n=1) births.

Cesarean section presents similar risk to natural childbirth in the transmission of infection and, despite the presence of HBV in human milk, it appears to be no significant increase in transmission through this pathway in the absence of fissures and breast lesions; breastfeeding showed no increase in the frequency of infection even in non-vaccinated newborns, despite that the carriers

mothers milk contain HBsAg. It is believed, however, that there is the possibility of contamination when the milk is offered to non-vaccinated infants[9].

The main moment for the contamination of the newborn is during labor, cesarean or vaginal delivery. Transmission from mother to child occurs in 90% of cases where the mother is seropositive for HBsAg and HBeAg, and in 10% of cases of seropositivity only for HBsAg[23]. Thus, the World Health Organization and UNICEF recommend exclusive breastfeeding, even in highly endemic regions, independent of immunoprophylaxis, because of the high morbidity and mortality in children who are not breastfed[9].

CONCLUSION

The study allowed us to identify and characterize seropositive pregnant women for HBV and HCV and released for the first time data on the prevalence of seropositivity among pregnant women in the city of Catalao-GO, Thus, we hope to have provided bases for planning follow-up activities of women living with hepatitis B and C viruses, as well as actions to prevent transmission.

The fact the information contained in the patients' medical records is not described in a standardized way hindered the elucidation of aspects relevant to the study, which emphasizes the importance of health professionals to realize the clear record of data in patients` medical records of pregnant women.

In order to increase the quality of services provided to the health of pregnant women, there is still a long way to go, which includes investments in the continuing education of health professionals, valuing aspects related to the beliefs and culture on health and disease of pregnant women attended, either in welcoming or monitoring, active surveillance for agents in pregnant women, early diagnosis and timely treatment to prevent vertical transmission of infectious diseases such as hepatitis B and C.

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